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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO HOT PRESSING

(*First Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1989

Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO HOT PRESSING

(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 15 June 1988, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1956 and has been revised to align it with ISO 105/X - 1984 Textiles — Tests for colour fastness X 11 Colour fastness to hot pressing, issued by the International Organization for Standardization (ISO) and also to incorporate changes in line with other standards on colour fastness tests.

0.3 Colour fastness of textile materials is of considerable importance to the consumer. The fastness depends not only upon the nature and depth of shade of the dyestuff used but also upon the nature of the fibre and the method of dyeing or printing employed; the same colouring matter, when used in dyeing or printing different fibres or when applied by different methods upon the same fibre, may give vastly different results. Formulation of standard methods of test for determining colour fastness of textile materials to different agencies likely to effect change in colour is, therefore, necessary.

1. SCOPE

1.1 This standard prescribes a method for the determination of colour fastness of textile materials of all kinds and in all forms to ironing and to processing on hot cylinders. Tests are given for hot pressing when the textile is dry, wet and damp. The end use of the textile usually determines which test should be made.

2. PRINCIPLE

2.1 Dry Pressing — The dry specimen is pressed with a heating device of specified temperature and pressure for a specified time.

2.2 Damp Pressing — The dry specimen is covered with a wet cotton adjacent fabric and pressed with a heating device of specified temperature and pressure for a specified time.

2.3 Wet Pressing — The upper surface of the wet specimen is covered with a wet cotton adjacent fabric and pressed with a heating device of specified temperature and pressure for a specified time.

2.4 The change in colour of the specimen and the staining of the adjacent fabrics are assessed with grey scales immediately and again after a period of exposure to air.

3. SAMPLING

3.1 Sample to determine conformity of a lot of coloured textile material to a specification shall be selected so as to be representative of the lot.

3.2 Sample drawn in compliance with the relevant material specification or as agreed to between the buyer and the seller to evaluate colour fastness of the material in the lot shall be representative of the lot.

4. APPARATUS

4.1 Heating Device — consisting of a pair of smooth and parallel plates equipped with an electrical heating system which is accurately controllable and giving a pressure on the specimen of 4 ± 1 kPa. Heat should be transferred to the specimen from the upper side only; if the lower plate is equipped with a heating system which cannot be turned off, the insulating sheet (**4·2**) acts as a heat shield.

NOTE 1 — The insulating sheet should be smooth and not warped. It is best to complete the specimen assembly on the insulating sheet before placing it on the heating device. The sheet should be cooled and the wet wool should be dried between test.

NOTE 2 — If a heating device is not available, a household iron may be used, but its temperature should be measured with a surface pyrometer or with temperature sensitive papers. The iron should be weighed so that its area and total mass are in the appropriate ratio to exert a pressure of 4 ± 1 kPa. However, due to temperature fluctuation during on-off differences over the iron surface, the accuracy and reproducibility are limited.

When a hand iron is used, this fact must be stated in the test report.

Under normal gravitational conditions, the area over which the mass of the heating plate should be distributed can be calculated in square centimetres by multiplying the mass in kilograms of the heating plate by the factor 24·525. If the area of the heating plate is less than that of the specimen, the required mass is calculated in kilograms by dividing the plate area (expressed in square centimetres) by the same factor. For composite specimen 10 cm × 4 cm, the mass of the heating plate assembly should be between 1·25 and 2·00 kg.

4.2 Smooth Insulating Sheet — of thickness 3 to 6 mm (*see* Note 1 under **4.1**).

4.3 Wool Flannel — of mass approximately 260 g/m². Two layers of this material are used to make a pad of thickness approximately 3 mm. Similar smooth wool fabrics or felt can be used to give a pad of thickness approximately 3 mm.

4.4 Undyed, Bleached and Unmercerized Cotton Cloth — of mass 100 to 130 g/m² and with a smooth surface.

4.5 Cotton Adjacent Fabric — measuring 10 cm × 4 cm.

4.6 Grey Scales — for assessing change in colour and staining.

5. PREPARATION OF TEST SPECIMEN

5.1 If the textile to be tested is fabric, use a specimen of 10 cm × 4 cm.

5.2 If the textile to be tested is yarn, knit or weave it into fabric and use a piece 10 cm × 4 cm or wind it closely round a piece of thin inert material measuring 10 cm × 4 cm to form a layer having only the thickness of the yarn.

5.3 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet 10 cm × 4 cm and sew the sheet on to a piece of cotton adjacent fabric to support the fibre.

6. PROCEDURE

6.1 The following temperatures are used (*see* Note):

110 ± 2°C
150 ± 2°C
200 ± 2°C

When necessary other temperatures may be used, provided that they are specially noted in the test report.

NOTE — The choice of pressing temperature used depends to a large extent on the type of fibre and on the construction of the fabric or garment. In the case of the blends it is further suggested to use the temperature appropriate to the fibre with the lowest heat resistance. The indicated temperatures cover three commonly used pressing conditions.

6.2 Specimens of materials that have been subjected to any heat or drying treatment must be allowed to condition in the standard atmosphere for testing, that is, 65 ± 2 percent relative humidity and a temperature of 27 ± 2°C before they are tested.

6.3 The bottom plate of the heating device is covered with insulating sheet (*see* **4.2**), wool flannel (*see* **4.3**) and dry undyed cotton cloth (*see* **4.4**), whether it is heated or not.

NOTE — In order to obtain the pressure per unit area of 4 ± 1 kPa, the total area of the wool flannel padding should bear a suitable relationship to the mass of the plate pressing down on the padding. If the fabric to be tested has an appreciable thickness, it is necessary either to increase the area of the test specimen or to augment the pressure-bearing surface using a suitable template made from the same material as the test specimen. If the plates of the heating device are smaller than the specimen size, the pressure depends on the design of the apparatus (ratio of mass to area of the top plate).

6.4 Dry Pressing — Place the dry specimen on top of the cotton cloth covering the wool flannel padding. Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.5 Damp Pressing — Place the dry specimen on top of the cotton cloth covering the wool flannel padding. Soak a piece of cotton adjacent fabric measuring 10 cm × 4 cm in distilled water, and squeeze or extract it to contain its own mass of water. Place the wet fabric on top of the dry specimen. Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.6 Wet Pressing — Soak the specimen and a piece of cotton adjacent fabric 10 cm × 4 cm in distilled water and squeeze or extract them to contain their own mass of water. Place the wet specimen on top of the dry cotton cloth covering the wool flannel pad and place the wet, adjacent fabric on the specimen. Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.7 Assess the change in colour of the specimen by the method prescribed in IS : 768-1982* with the appropriate grey scale immediately and again after the specimen has been allowed to condition for 4 h in the standard atmosphere for testing textiles.

NOTE — In cases of doubt in the colour fastness rating as assessed by an observer, the assessment should be done by at least three observers and the overall average rating should be reported.

6.8 Assess the staining of the cotton adjacent fabric with appropriate grey scale by the method

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*Method for evaluating change in colour (*first revision*).

prescribed in IS : 769-1982*. Use the more heavily stained side of the cotton adjacent fabric for the assessment (*see* Note under **6.7**).

7. REPORT

7.1 The report shall include the following:

a) test procedure (dry, damp or wet);

b) temperature of the heating device;

c) numerical rating for change in colour immediately after testing and after conditioning for 4 h in the standard atmosphere for testing textiles; and

d) numerical rating for the staining of cotton adjacent fabric.

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*Method for evaluating staining (*first revision*).

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